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ABSTRACT

A distinction is made between program evaluation and project evaluation. The former is used to determine the effectiveness of a particular program or to compare programs. The latter is used in the initial stages of program development to define and monitor progress; to identify problems at an early stage; to record what is done and why; and to provide decision-making data. Test selection criteria and procedures for establishing external and internal validity are defined. Program evaluation consists of these steps: (1) defining objectives; (2) identifying information to document attainment of objectives; (3) selecting or developing instruments to collect this information; (4) establishing success criteria for these instruments; and (5) developing a management system for the administration and analysis of evaluation forms. Project evaluation consists of four steps, each having its own evaluation form. Steps include specifying tasks; monitoring progress toward completion; documenting completion; and evaluating completed tasks. The project evaluation approach follows Provus' Discrepancy Evaluation Model. A role distinction is made between project evaluator as manager of activities and the program evaluator as impartial planning consultant. (CP)

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THE PROCESS OF EVALUATION

by

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I. Perspective

In evaluating a program two types of evaluation may be of concern to the evaluator: program and project evaluation. Program evaluation is used to determine how effective a particular program is or to determine if one program is more effective than another. Project evaluation is used to provide means of defining and monitoring program progress; to assure identification of problems before they disrupt activities in other parts of the program; to maintain a record of what is in fact done and why; and to provide data for decision-making.

Both types of evaluation are carried out through the use of measurement tools. A measurement tool is a defined technique of collecting data that are needed to conduct the evaluation. The measurement tools most familiar to everyone are examinations and questionnaires. However, checklists, interviews, and direct observation of individuals are also measurement tools.

In choosing the specific measurement tool to use in project or program evaluation, consideration must be given to the reliability, validity, availability of normative data, and utility of the measurement tool. Specific guidelines for review of instruments are published by the American Psychological Association.[1]

Reliability refers to the extent to which the measurement tool is consistent in measuring whatever it measures. The reliability of the measurement tool is commonly reported as a correlation coefficient. A correlation coefficient is a measure of the degree of relationship between two

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[1] American Psychological Association. Standards for Educational and Psychological Tests and Manuals. Washington, D.C. APA, 1966 .

sets of measures. The coefficient may be in terms of an alternate-form reliability correlation coefficient; split-half reliability correlation coefficient; or a test-retest reliability correlation coefficient. An alternate-form reliability correlation coefficient indicates the extent to which two forms of the measurement tool are consistent in their results. A split-half reliability correlation coefficient indicates the extent to which the results of one-half of the measurement tool are consistent with the results of the other half. A test-retest reliability correlation coefficient indicates the extent to which results obtained by administering the same measurement tool on two different occasions are consistent.

Ones use of the tool will determine which type of reliability estimate is relevant to the case. It is essential to establish the reliability of the measurement tool used in the evaluation study. If the tool is not reliable, the results obtained will be dictated by chance factors.

Reliability is a necessary but not sufficient condition for validity, also an essential requirement for the measurement tool. Validity refers to the extent to which the tool measures what it is intended to. The validity of the measurement tool may be established in terms of content validity, construct validity, predictive validity, or face validity. Content validity assesses the extent to which the tool adequately samples outcomes of the universe of behaviors it is intended to measure. Construct validity refers to the extent to which the tool yields an accurate description of the psychological construct it is intended to describe. Predictive validity refers to the extent to which the tool accurately indicates future success in the area for which it is used as a predictor. Face validity refers to the acceptability of the tool by the examinee in terms of apparent

uses to which it is put. Depending upon the use of the tool, the importance of establishing each type of validity will vary.

The measurement tool used in the evaluation study should also have established data on results observed from using the tool on groups similar to the present group of interest. Without relevant normative data, interpretation of results becomes difficult.

Finally, the decision of which particular measurement tools are to be used in the evaluation study should be based on the utility of the tool in terms of money, time to collect the data, and any other practical needs relevant to the case.

Evaluation studies, however, must not only concern themselves with the quality of the measuring tools, but also the conditions under which the tools are to be used. The conditions of the study must be arranged in such a way that after its conclusion a cause-effect relationship between the program or treatment and its observed outcomes can be made. In other words, the evaluator must establish the internal validity of the study.

In order to do so, the evaluator must eliminate all other explanations or rival hypotheses for a change in the value of the dependent variable, other than the independent variable or in this case the program. Several commonly cited rival hypotheses are history, maturation, testing, instrumentation, statistical regression, selection bias, and experimental mortality (Campbell and Stanley, 1972). History refers to the specific events occurring between the first and second measurement in addition to the program or treatment. Maturation refers to processes within the respondents operating as a function of the passage of time per se, including growing older, growing more tired, and the like. Testing refers to the effect of taking

a test upon the scores of a second testing. Instrumentation refers to changes in the calibration of the measuring tool or changes in the observers used to collect the data. Statistical regression refers to the value of scores on the measurement tool regressing toward the mean on a second observation because the group has been selected on the basis of their extreme scores. Selection bias refers to biases resulting from differential selection of respondents for the comparison groups. Mortality refers to differential loss of respondents from the comparison group. Selection-maturation interaction refers to different maturational rates of groups as a result of selection biases.

To eliminate these rival hypotheses, the researcher may use a control group. A control group is a group like the treatment group in most ways except the absence of the treatment. Using a control group eliminates rival hypotheses or threats to internal validity as they are commonly referred to, in that the rival hypotheses should be manifested equally in both groups. If the program or treatment is effective, post measures of the treatment group should be significantly different from those of the control group.

The evaluator may also eliminate rival hypotheses through the use of randomization; i.e., assigning subjects to the control or treatment group through a random procedure. Thus, randomization insures that every subject to be assigned has an equal chance of appearing in the treatment or control group through a random procedure. Randomization negates pre-existing differences between both groups.

If possible, the evaluator should use both a control group and randomization procedure to eliminate rival hypotheses. A control group is not always sufficient to eliminate threats to internal validity because the groups

may be different on other variables other than the treatment. Using randomization only may not eliminate such rival hypotheses as testing, statistical regression, instrumentation, and history. If both techniques are used, however, generally all threats to internal validity are eliminated.

Including a control group in the study and using randomization are not the only conditions under which rival hypotheses are eliminated. If the treatment or program is of short duration, history and maturation can be eliminated as threats to internal validity without use of a control group. The rival hypothesis of testing may also be eliminated by the use of unobtrusive measures. If the treatment group can be put in an extremely controlled environment, history can be eliminated as a rival hypothesis. When participation is mandatory, mortality is controlled for and when subjects are from the middle range of a distribution, regression as a threat to internal validity is controlled for.

The evaluator must also give consideration to the external validity of the study. External validity addresses the question of generalizability: to what populations, settings, treatment variables, and measurement variables can the observed effect be generalized. Factors jeopardizing external validity are reactive effects of testing, interaction effects of selection biases and the experimental variable, reactive effects of experimental arrangements, and multiple-treatment interference (Campbell and Stanley, 1972). The reactive effect of testing refers to a pre-test increasing or decreasing the respondents' sensitivity or responsiveness to the program or experimental variable, making results unrepresentative of the effect of the program or treatment variable on a population of respondents who have

not been pre-measured. The interaction effects of selection and the experimental variable refers to the fact that the observed effect may be a result of the unique characteristics of the group selected. Reactive effects of experimental arrangements refers to the respondents realizing they are in an experimental situation. Multiple-treatment interference refers to the situation where the same treatment is continually applied to the same respondents. The extent to which these threats to external validity can be eliminated is directly related to the extent one can generalize findings from one population of subjects to another.

II. Evaluating the Program

The process of evaluating a program consists of the following steps:

- Step One: Identifying what is to be evaluated;
- Step Two: Identifying what information is needed to conduct the evaluations;
- Step Three: Selecting or developing the instruments to collect the necessary information;
- Step Four: Defining success; and
- Step Five: Developing a management system.

Each of these steps will be further described in the following sections.

A. Step One: Identifying What is to be Evaluated.

Identifying what is to be evaluated is the most crucial step in the evaluation process; the degree of success in which this is carried out will limit the degree of comprehensiveness and utility the evaluation can attain. It is carried out by examining written documents concerning the program and meeting with the program director for the

purpose of developing an explicit statement of what it is the program intends to do. Simple as it seems, this is often a difficult task. When dealing with newly developing programs, often the program director will be unsure, and sometimes rightly so, of what the goals of the program will be. In such cases the use of an advisory board consisting of designated "experts" from relevant fields or a review of the literature on other programs may be feasible means of clarifying the intentions of the particular program. In dealing with existing programs, the program director may not see the need to develop a formal statement of program goals particularly if the program has existed and grown without a clear conception of its goals. In other cases, goals may exist but may be so general they are meaningless. However, by focusing on what changes the program wishes to make in both knowledge and skill in students, professionals working within the institution, and the community in general, it is likely that some relevant goals will emerge.

Completion of this Task is attained when both the evaluator and program director reach an agreement on what the program intends to do and develop a formal statement specifying this.

In summary, Step One. identifying what is to be evaluated, may be broken down into the following tasks;

1. Examine written material relevant to the program.
2. Meet with the program director to discuss the program goals.
3. Develop a formal statement of what the program intends to do.

The first and second of these tasks need not progress in the

order listed and may be repeated as frequently as necessary to complete Step One.

B. Step Two: Identifying What Information is Needed to Conduct the Evaluation.

After the evaluator and program director have reached an agreement upon what the program intends to do, they must next come to an agreement about what information or data will document the successful attainment of the program goals. This process can be carried out by the evaluator and program director jointly developing a list of several possibilities for each goal or by the evaluator developing a list of possibilities and subsequently presenting them to the program director. For example, if a goal of the program is to increase student knowledge in accounting, successful attainment could be indicated by change in performance on an examination or by the students ability to correctly fill out a balance sheet. Frequently at this point it becomes evident that some goals need to be further clarified. Thus Steps One and Two may at times be approached concurrently. The focus at this point, however, is on identification of the type of information that will document attainment of the goals; not on the particular instrument or procedure to be utilized to collect the data.

Once the list of types of information that could document attainment of the goal is developed, those to be utilized in the particular case can be selected by the evaluator. In making the selections, consideration must be given to reliability, validity, both internal and external and those practical matters previously addressed.

In summary, Step Two, identifying what information is needed to

conduct the evaluation, consists of the following tasks:

1. Develop a list of possible types of information that would document successful attainment of the goal.

2. Select from the list developed those most appropriate.

C. Step Three: Selecting or Developing the Instruments to Collect the Necessary Information

Knowing what types of information are needed, the evaluator can then proceed to identify or develop specific instruments to collect the information. Sources from which possible instruments can be identified include but are not limited to the following:

1. Buros, O.K. Mental Measurements Yearbooks. Highland Park, NJ: Gryphen Press 1938, 1940, 1949, 1953, 1959, 1965, 1972.;

2. Buros, O.K. (Ed.) Tests in Print. Highland Park, NJ: Gryphen Press, 1961.;

3. Test publisher catalogs; and

4. Professional journals and publications.

Consideration of data collection instruments, however, should not be limited to standardized instruments. Metfessel and Michael offer a variety of measures that can be utilized in evaluation of school programs in addition to standardized instruments (See Appendix). The final selection of instruments and techniques should be made in consideration of those guidelines of the American Psychological Association previously cited.

If appropriate measures cannot be identified, the evaluator must consider the feasibility of developing appropriate measures. The decision to do so or not will be influenced by the time, money and staff available for the evaluation. Any instrument created must be developed

and reviewed with the same scrutiny that existing instruments are.

In summary Step Three, selecting or developing the instruments to collect the necessary information, proceeds by:

1. Identifying possible existing instruments or techniques available;
2. Reviewing those instruments or techniques identified;
3. Selecting those most appropriate from those available; and
4. Developing instruments, if feasible when appropriate.

D. Step Four: Defining Success

After the specific instruments and techniques have been selected, success must be operationally defined prior to beginning the data collection. This step is one which must be left to the sole discretion of the program director and program staff. For each instrument or data collection technique a decision must be made as to what results out of all of those possible will be considered successful attainment of the goal. For example, on examinations a specific cut-off score must be identified as distinguishing between successful and unsuccessful attainment of the program goal. If observation schedules are utilized, a specific number of occurrences of a given behavior may be agreed upon as indicating successful attainment of the goal. In many instances establishment of a criterion level is difficult and anxiety producing for the program director, particularly if there is little prior data to base the decision on. If this is the case, the evaluator should clarify to the program director that the arbitrariness of the decision will be addressed in the evaluation report. Nevertheless, no evaluation data should be collected until these decisions

are made. Without an adequate understanding of what will be considered success between the program director and evaluator, interpretation of any data collected in the evaluation may lead to what both parties feel are false accusations concerning the success and failure of the program.

In summary, Step Four, defining success, consists of one major task:

1. Defining criterion levels of success for all instruments and data collection techniques by the program director.

E. Step Five: Developing of a Management System

Development of a management system is necessary to insure that all needed data is collected and synthesized to make it most meaningful.

Developing a management system consists of making decisions in regard to who will distribute or administer the evaluation forms, how response to the forms will be enhanced, to whom the forms will be returned, the schedule of administration for the forms, the types of analyses to be performed, who will receive immediate feedback of the results, and how the data will ultimately be synthesized.[2]

Making these decisions can be facilitated by organizing the forms by whom the respondents will be. This process is likely to highlight instruments which are not essential to the collection of the evaluation data and areas in the instruments requiring further revision before the instruments are utilized. Thus, development of the management

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[2] "Forms" as used here refers to any document from which data are collected.

system can serve to clarify further the focus and process of the investigation.

In identifying an individual to administer the forms, consideration should be given to a person who spends a considerable portion of his/her time working with the program staff, is familiar with the forms and whose request for cooperation will be seen as necessary to be in compliance with.

This individual should also typically be the individual to whom the forms are returned to allow for the closest possible monitoring of the system. Even in unusual circumstances, where the information is urgently needed by the program developers it is unwise to have the forms returned directly to the program director. Program directors are frequently involved in enormous amounts of administrative work and forwarding of the forms to the evaluation staff is frequently given low priority. Frequently, by routing forms to the evaluation staff initially, much of the administrators time can be saved. For example, instead of reading thirty evaluation forms each of which require ten minutes, the administrator may only need to spend five minutes reading a summary report of the thirty forms forwarded to him by the evaluation staff.

Careful consideration must be given to what procedures will best insure a high response rate. For some groups several follow-ups in the form of postcard reminders and telephone calls will be necessary. For other groups use of incentives, both monetary, materialistic and non-materialistic may be necessary. Still, for other groups use of administration policies may be the best approach. Familiarity with

the characteristics of the respondents will facilitate selection of the most appropriate approach. In some cases, a combination of approaches may be warranted.

The decision in regard to the schedule of administration for the forms must be contingent upon the evaluation design and particular variables initiated in the evaluation. In addition to the evaluation design, consideration must also be given to the practicality of the situation and utility of the information collected. For example, it would be unwise to distribute surveys to teachers and expect a response during a week in which final examinations are given and grades are determined. Equally unwise would be the administration of an attitude scale midway through the academic program rather than at completion of the program when the aim is to determine attitude change after being in the program. Of course, if the attitude scale were administered midway and at completion of the program, the midway measure would have some utility.

Determining the types of analyses to be performed is related to the objectives of the evaluation. There are three major modes of analyses; descriptive, correlational and experimental. The descriptive approach is self-explanatory. Its purpose is to identify what happened or what exists. The correlational approach also includes the descriptive function, but goes beyond this in determining the extent to which two variables are related. The experimental approach includes the functions of the previous two approaches as well as investigating causal-effect relationships. To select the appropriate mode of analysis the objectives of the evaluation must be matched with the function of the analysis

level. Associated with each level of analysis are corresponding statistical techniques. Each statistical technique also makes assumptions which must be met in order for the statistic to be validly used.

Thus, the individual developing the plan of analysis must be competent in calculating the statistics, and have adequate knowledge of the assumptions underlying the statistics. If someone on the program staff is not available, an outside consultant should be recruited.

Having made all the previous decisions, the final step, developing plans to synthesize the data that is to be collected must be made prior to installation of the system. The number of "synthesizing" documents should be kept to a minimum; however, caution should be taken to avoid inclusion of data from documents that are unimportant and only peripherally related to each other. Typically, this step evolves into development of an outline for a final report of the evaluation. As this outline is developed, consideration must be given to whom the report is to be written, who will receive copies, and what the report will be used for.

As the system is installed according to those policies originally agreed upon, it should be periodically reviewed to identify changes indicated as necessary through application of the proposed system. Undoubtedly, some changes will be required due to the impossibility of foreseeing all outside restraints which will be encountered influencing the data collection. However, management policies for administering the forms are essential from the beginning to serve as

guideposts for the initial use of the forms.

In summary, Step Five, developing a management system can be broken down into the following tasks:

1. Deciding who will respond to which forms;
2. Deciding who will distribute the forms;
3. Deciding to whom the forms will be returned;
4. Designing a schedule for administration of the forms;
5. Developing a plan of analysis;
6. Identifying who will receive immediate feedback; and
7. Identifying how the data will be synthesized.

In retrospect what the preceeding steps in conducting a program evaluation have involved are development of a plan and adherence to it.

III. Evaluating the Project

Project evaluation is generally carried out in the initial stages of program development. As was stated previously project evaluation is used to provide means of defining and monitoring program progress; to assure identification of problems before they disrupt activities in other parts of the program; to maintain a record of what is in fact done and why; and to provide data for decision-making. After the program is developed and stabilized, project evaluation may not be necessary.

The process of evaluating a project consists of the following steps:

Step One: Specifying activities and criteria for successful performance;

Step Two: Monitoring progress towards completion of the activities;

Step Three: Documenting completion of the activities; and

Step Four: Evaluating the completed activity.

Prior to initiating project evaluation it is essential that a well thought-out work plan be developed. The work plan should identify the major activities which must be accomplished to complete the project and their relationship to each other. Program Evaluation Review Techniques (PERT) should then be utilized to put the activities into a time frame.[3] The staff of the project should participate as much as possible in development of the work plan to develop a sense of ownership and willingness to cooperate in completing tasks assigned. Following this the evaluation can then begin. In a project with a relatively small staff the steps in project evaluation can be carried out on an informal basis. In a project with a relatively large staff it may be necessary to develop a formal mechanism to carry these activities out. The subsequent sections present an example of a formal mechanism for conducting the evaluation. Specific projects may wish to adapt these to their own needs for formal or informal use.

A. Step One: Specifying Activities and Criteria for Successful Performance

Taking the work plan, each activity can be broken down into a series of tasks to be assigned to a project member. The Task Specification Form in Figure 1 or one similar to it can be utilized by the project director to assign the task.

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[3] Useful references explaining PERT include the following:

Case, C.M. "The application of PERT to Large-Scale Educational and Evaluation Studies." Educational Technology, Oct. 1969, 9, pp. 79-83.

Cook, D.L. Program Evaluation and Review Technique Applications in Education. Washington, D.C.: U.S. Government Printing Office, 1966.

Special Projects Office, Department of the Navy, PERT Summary Report, Phase I. Washington, D.C.: U.S. Government Printing Office, 1962.

Figure 1

TASK SPECIFICATION FORM

Task Number: _____

Assigned to: _____

To be completed by: _____

Objective task is related to in overall plan: _____

Task Description (Describe the task in enough detail that it is replicable.)

Product Completion Criteria (Specify the form in which data are to be presented and the characteristics of the data which will be acceptable.)

Process Completion Criteria (Specify parties to be involved, the flow of feedback from the task and decisions to be made.)

The completion criteria included on the form should be of two types: product and process. The product completion criteria should be a description of what the observable end product of the task should include. It should specify the form in which data are to be presented and the characteristics of the data which will be acceptable. The process completion criteria should specify parties to be involved, the flow of feedback from the task, and decisions to be made. The process completion criteria should describe the task performance in enough detail that it is replicable and it should uphold all prior decisions that were made.

The value of this form lies in developing clear understanding between the task doer and the task assigner of what it is that is to be done.

B. Step Two: Monitoring Progress Towards Completion of the Activities

If the activities are put into a time frame as the work plan is developed, various times can be identified for making progress checks on the completion of each task. Thus problems can be identified as they emerge and alternative strategies developed for completing the task, altering the task or identifying new tasks. The form presented in Figure 2 is useful for this type of monitoring. The form presented in Figure 3 is useful for documenting revisions in tasks or strategies.

The Task Progress Report Form in Figure 2 should be released by the evaluator to the task doer and returned by the task doer to the evaluator. The Task Modification Form should be completed by the evaluator in cooperation with the program director and task doer.

Figure 2

TASK PROGRESS REPORT FORM

Task Number: _____

Assigned to: _____

Original Completion Date: _____

What steps have been taken thus far to perform the task?

Estimate the liklihood of your completing the task on the specified completion date.

1. I definitely will not complete the task.
2. I am uncertain if I will be able to complete the task.
3. I definitely will complete the task on the specified completion date.

If you have checked responses 1 or 2, indicate specific problems you are encountering.

Figure 3

TASK MODIFICATION FORM

Task Number: _____

Today's Date: _____

Assigned to: _____

Original Completion Date: _____

Check the areas in which changes have been made in regard to the Task Specification Form

Completion Date _____

Person Assigned the Task _____

Product Criteria _____

Process Criteria _____

Indicate specifically any changes that have been made and the reason for the change.

C. Step Three: Documenting Completion of the Activities

As each task is completed documentation should be obtained from the task doer in regard to both product and process. The Task Completion Form in Figure 4 can assist in this documentation. This form should be completed by the task doer.

D. Step Four: Evaluating the Completed Activity

After the task is completed, the evaluator should judge whether or not the product and process completion criteria have been met. (The Task Evaluation Form in Figure 5 can be utilized for this.) If the criteria have not been met, a decision must be made in regard to the appropriate technique for proceeding.

In retrospect, this approach to project evaluation follows the Discrepancy Evaluation Model for evaluation proposed by Malcolm Provus[(1971)]. The model defines program standards as criteria for each program stage; determines whether a discrepancy exists between some aspect of program performance and the criteria governing that stage; and uses the discrepancy information either to change performance or to change program standards. When discrepancies have been identified, the next sequence of steps in the model are to determine where there is a discrepancy; what corrective actions are possible; and what corrective action is best. At each stage there are four alternatives for program activities: (1) go on to the next stage, (2) recycle the stage after there has been a change in the program's standards or operations, (3) recycle to an earlier stage, or (4) terminate the project. The model has been particularly helpful in checking out pilot or new programs; diagnosing programs that are not functioning

Figure 4

TASK COMPLETION FORM

Task Number: _____

Completed by: _____

Completion Date: _____

Product Completion (Present or attach a copy of the product completion data previously specified in the Task Specification Form.)

Process Completion

What other parties were involved?

To whom was feedback of the task reported to:

Were new decisions made?

Figure 5

TASK EVALUATION FORM

Task Number: _____

Completed by: _____

Completion Date: _____

Today's Date: _____

Product Completion Criteria

Does the product completion data presented in the Task Completion Form meet the product completion criteria previously established for the task? If not, indicate specific discrepancies that exist.

Process Completion Criteria

Were all appropriate parties involved? If not, indicate who was omitted.

Did the process uphold all prior decisions that were made? If not, indicate which decisions were violated?

Was the feedback of the process reported to the appropriate parties? If not, indicate who was neglected.

If new decisions were made, list future project objectives you feel they will effect.

well; and in improving program efficiency. Thus, the model appears to be a useful framework around which to develop the project evaluation for program development.

When utilized on a formal basis the proposed system may be likely to create more paper work than the benefits accrued from utilizing it. If this is the case it is recommended that forms be combined or eliminated to fit the particular situation.

IV. Summary

An evaluator may be one of two types; a project evaluator or a program evaluator. The project evaluator's services are utilized in the initial stages of program development. To function adequately the project evaluator should be highly familiar with the project; he should be a member of the project team. In essence he should serve as a manager of activities. The program evaluator's services are utilized as the program develops and throughout the life of the program. To function adequately the program evaluator should be familiar with the program but he should not be a full-time member of the program staff least his objectivity and credibility be diminished. In essence he should serve as a program planning consultant. Because of the conflicting need for the project evaluator to be highly familiar with the activities of the project and for the program evaluator to be familiar yet distant enough from the program to maintain objectivity, it is preferred practice not to intermix the two roles.

*Multiple Criterion Measures for Evaluation of School Programs

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*This list has been developed by Newton Metfessel and William Michael and appears in the following source:

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